REMARKS

Reconsideration and further examination is respectfully requested.

Response to Advisory Action

This paper is a preliminary amendment filed with a Request for Continued Examination. The below comments will address rejections previously put forth in the Final Office Action mailed November 21, 2005. However, before going into these remarks, Applicants would like to address a comment made by the Examiner in the Advisory Action mailed March 15, 2006.

In the Advisory Action, the Examiner stated:

"... The applicant argues that the cited art does not teach, "constructing a failover tree .... prior to a detection of a degradation or failure affecting the primary end system" The examiner asserts that Lamport explicitly discloses such limitations. The examiner references col. 63 lines 1048 where Lamport discloses using a multiplicity of switches forming a spanning tree, each switch containing a configuration change detection means for detecting a link failure and a new connection being formed... that new connection may be broadly interpreted as the switching of a failed link to an alternate link ... *Furthermore, Lamport discloses a reconfiguration means coupled to the configuration change detection means which is activated* ***only after a configuration detection is experienced****..."*

The Applicants note that their claims are clearly drawn to a method and apparatus that calculates failover trees *prior* to any actual failure in the system. The Examiner clearly recognizes that Lamport does not change links until *"only after"* a failure is detected. Thus, as detailed below, the teachings of Lamport are fundamentally opposite of that of the claimed invention. The Examiner appears to recognize this fact, but is not be giving patentable weight to the term 'prior', which is used in the claims. Applicants have further amended the claims in an

attempt to highlight this distinction. Should the Examiner still maintain this reference is proper, Applicants would request an opportunity to receive an interview with the Examiner at his convenience.

Rejections under 35 U.S.C. §103

Claims 1-47 were rejected under 35 U.S.C. §103(a) as being unpatentable over Beardsley et al (US 6,006,342) in view of Lamport et al (U.S. 5,138,615).

Beardsley:

Beardsley describes, at column 2, lines 46 - column 3 lines 6:

> "...To address the shortcomings in the prior art described above, preferred embodiments of the present invention provide a system for handling failures in a storage controller interfacing between a plurality of host systems and direct access storage devices (DASDs). The storage controller directs data from the host systems through first and second data paths in the storage controller to a DASD. A first processor, first non-volatile memory unit (NVS), and a first cache are associated with the first data path and a second processor, a second NVS, and a second cache are associated with the second data path. A bridge provides communication between the first processor and the second NVS and the second processor and the first NVS.
>
> During normal operations prior to a failure in the storage controller, data directed to the first data path is written in the first cache and communicated with the first processor to the second NVS via the bridge for storage in the second NVS. Data directed to the second data path is written in the second cache and communicated with the second processor to the first NVS via the bridge for storage in the first NVS. A point of failure within at least one of the first processor, first cache, and first NVS is handled by routing the data directed to the first data path to the second processor and writing the routed data to the second cache and the second NVS. Upon repairing the point of failure, the data directed to the first data path is rerouted to the first processor, wherein the rerouted data is written in the first cache and communicated with the first processor to the second NVS via the bridge for storage therein..."

Thus Beardsley is directed to a storage controller, and basically describes a system which includes a redundant path that is used 'such that no single point of failure will incapacitate the entire storage controller...'

Lamport:

Lamport describes a mesh connected local area network that provides automatic packet switching and routing between host computers coupled to a network. Lamport describes, in the Abstract:

"...The network has a multiplicity of cut-through, nonblocking switches, each capable of simultaneously routing a multiplicity of data packets. Low host-to-host latency is achieved through the use of cut-through switches with separate internal buffers for each packet being routed. The switches are interconnected with one another and are coupled to the host computers of the network by point to point full duplex links. While each switch can be coupled to ten or more network members, i.e., switches and hosts, each link is coupled to only two network members and is dedicated to carrying signals therebetween. Whenever a new switch or link is added to the network, and whenever a switch or link fails, the switches in the network automatically reconfigure the network by recomputing the set of legal paths through the network..."

Thus Lamport is directed to a method of managing a mesh network. Lamport explicitly states, at column 3, lines 53-60:

"...The switches in the network automatically detect any changes in the configuration of the network, such as the addition of switches and links as well as the removal or failure of network components. *Upon detecting a change in the network configuration, all of the switches participate in a distributed reconfiguration process which automatically and quickly reconfigures the network by recomputing all the legal paths for routing message packets through the network.* ***The reconfiguration process is sufficiently fast that it has minimal impact on the performance and operation of the network..."*** (Emphasis added by Applicant)

The Examiner states, at pages 2-3 of the Office Action:

"... Beardsley ... discloses a second processor, non volatile memory unit and cache that is a backup system to a first processor, non volatile memory and cache (col. 2, line 59- col. 3 line 6).... Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (back up system).... Beardsley discloses the logic used to control failover and fail back... However, Beardsley does not specifically disclose constructing a failover tree to the backup system. Lamport et al ... discloses in the event of a failure in the primary path, re-computing the paths between hosts on a network (Col. 33 line 60- col. 34 line 3). Furthermore, Lamport discloses spanning tree

links used in the event of reconfiguration, which occurs when there is a failure (col. 38, line 34-48).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to include a spanning tree, ensuring that data is transmitted in a predictable and efficient fashion (col. 38 lines 34-48)..."

Applicants respectfully disagree.

M.P.E.P. §2143 states "to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations..." The Examiner's combination of Beardsley and Lamport fails to satisfy the primary facie case of obviousness for several reasons.

No Motivation for the Modification Suggested by the Examiner

Applicants disagree that one would be motivated to modify Beardsley, as suggested by the Examiner, to 'construct a failover tree to the backup system.' In particular Applicant would submit that the Examiner is not giving patentable weight to the term 'failover tree', as included in the Applicants claim.

The term The Examiner acknowledges that Beardsley 'does not disclose constructing a failover tree to the backup system'. The Examiner then relies on Lamport to satisfy this element of the invention, thus inferring that Beardsley would be motivated to modify its structure to 'construct a failover tree to the backup system'.

Lamport defines a spanning tree at column 6 of the application to be:

"Spanning tree" as used herein, means a representation of the interconnections between the switches in a mesh connected network. Technically, a spanning tree is a non-cyclic connected subgraph which represents a portion of the network, excluding the host computers and certain links between the switches. The excluded links make the network an acyclic graph rather than a tree because the nodes of the spanning tree can have inter-connections within each level of the graph..."

Thus at issue is whether Beardsley would be motivated to 'construct a failover tree' to a backup system. Beardsley's 'backup systems' are direct connected, hardwired, storage. Accordingly, Applicant would submit that Beardsley would have not need to 'construct a tree.' The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Because there is no desirability for the inclusion of this step in Beardsley, there is no motivation for the modification suggested by the Examiner. For at least this reason, Applicants maintain their position, submit that the rejection is overcome, and request that it be withdrawn.

Combination neither discloses or suggests the claimed invention

However, even if a motivation could be found for modifying the references as suggested by the Examiner, the combination of references neither discloses nor suggests the limitations of the claimed invention.

For example, claim 1 recites the step of "...constructing a failover tree through the optical communication system to the at least one backup end-system *prior to a detection of a*

degradation or failure affecting the primary end-system..." The Examiner admits that Beardsley does not disclose 'constructing a failover tree,' The only teaching of constructing a tree is by Lamport, which describes reconfiguring *after* detection of a failure.

The Examiner states, at page 15 of the office action :

"... Lamport discloses each switch comprising a knowledge of a spanning tree identifying how a plurality of switches are interconnected, where a spanning tree depicts a number of fault paths that may be chosen in order to route data to a destination. Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention that a failover tree exists before degradation in that a spanning tree exists, however, on degradation a legal path is chosen..."

Applicants respectfully disagree with the Examiner's characterization of Lamport as teaching that 'a failover tree exists before degradation in that a spanning tree exists, on degradation a legal path is chosen...'

Such a characterization ignores the *actual* language of Lamport, which clearly states, at column 3, lines 53-60:

> "...The switches in the network automatically detect any changes in the configuration of the network, such as the addition of switches and links as well as the removal or failure of network components. ***Upon detecting a change in the network*** configuration, all of the switches participate in a distributed reconfiguration process which automatically and quickly reconfigures the network by recomputing all the legal paths for routing message packets through the network. ***The reconfiguration process is sufficiently fast that it has minimal impact on the performance and operation of the network...*"** (Emphasis added by Applicant)

At column 33 line 67 – column 34 line 2 Lamport states:

"... Once a failure is detected.... the reconfiguration programs in all the switches automatically reconfigure the network --- which means that all the legal paths between the hosts on the network are recomputed and then stored in the routers in the switches..."

Thus, Lamport expressly teaches away from a failover tree being in place before detectin of degradation. It is well known that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Accordingly, Lamport's statement that the generation of a failover tree after failure of a switch is 'sufficiently fast,' cannot be ignored and in fact teaches away from the claimed invention.

The Examiner states that 'Beardsley discloses a failover process where the second path is already known for failover...', however, Beardsley does not disclose, as admitted by the Examiner, 'constructing a failover tree...' Applicants would submit that there is a clear and patentable distinction between a 'failover tree' and a hardwired link.

Accordingly, Applicants' claimed invention is patentably distinct over the combination of Beardsley and Lamport. For example, Claim 1 recites "...A method for managing alternate site switching in an optical communication system having a protected end-system in communication with a primary end-system over an optical communication network, the method comprising ... designating at least one backup end-system to back up the primary end-system ... *constructing a failover tree through the optical communication system to the at least one backup end-system prior to a detection of a degradation or failure affecting the primary end-system* ... detecting a

degradation or failure affecting the primary end-system ... and switching traffic from the primary end-system to one of said at least one backup end-systems *using the failover tree*.

Because neither Beardsley, Lamport nor the combination thereof either disclose or suggest "constructing a failover tree through the optical communication system..." ,and because the combination of references fails to teach or describe every limitation in the claim, claim 1 is patentably distinct over the combination, and the rejection should be withdrawn. Dependent claims 2-17 serve to add further patentable limitations to claim 1 and are therefore allowable with claim 1.

Independent claim 18 includes limitations similar to those of claim 1 which distinguish over the combination of Beardsley and Lamport. For example, claim 18 recites "... A device for managing alternate site switching in an optical communication system having a protected end-system in communication with a primary end-system over an optical communication network, the device comprising ... failover tree construction logic operably coupled to construct a failover tree to the at least one backup end-system prior to failure or degradation of the primary end-system..." Accordingly, for at least the reason that the combination of references fails to teach or describe every limitation in the claim, claim 18 is patentably distinct over the combination, and the rejection should be withdrawn. Dependent claims 18-26 serve to add further patentable limitations to claim 1 and are therefore allowable with claim 18.

Independent claim 27 recites "...A device for managing alternate site switching in an optical communication system having a protected end-system in communication with a primary end-system over an optical communication network, the device comprising ... a failover tree database for recording the structure of a failover tree having at least a root node, the failover tree

computed prior to a detection of a degradation or failure affecting the primary-end system ... detection logic operably coupled to detect a degradation or failure affecting the primary end-system ... and ... signaling logic operably coupled to send a release message upstream toward the root node over the failover tree when the detection logic detects the degradation or failure affecting the primary end-system to release light-path resources to the primary end-system..." As mentioned above with regard to claims 1 and 18, neither Beardsley nor Lamport disclose or suggest optical systems, and thus neither can disclose nor suggest releasing 'light-path' resources as disclosed in the claim. In addition, although the Examiner refers Applicant to the disclosure of the DEAD status that is disclosed in Lamport, no mention or suggestion is made of the messages being forwarded 'upstream'. Rather, it appears that a DEAD status is inferred, in Lamport, by a device's failure to respond to a keep-alive message. Accordingly, for at least the reason that the combination of references fails to disclose or suggest several elements of the claimed invention, it is respectfully submitted that the rejection is overcome and should be withdrawn. Dependent claims 28 and 29 serve to further limit claim 27 and are allowable with claim 27.

Independent claim 30 recites "... A device for managing alternate site switching in an optical communication system having a protected end-system in communication with a primary end-system over an optical communication network, the device comprising ... a failover tree database for recording the structure of a failover tree having a backup end-system, the failover tree identified prior to failure of the primary end-system... first receiving logic operably coupled to receive a release message; and switching logic operably coupled to switch traffic from a primary end-system to a backup end-system using the prior constructed failover tree when the first receiving logic receives the release message..." Accordingly, for reasons similar to those put

forth with regard to claims 1 and 18, claim 30 is also patentably distinct over the combination of Beardsley and Lamport, and it is requested that the rejection be withdrawn. Claim 31 serves to further limit claim 30 and is thus allowable with claim 30.

Claim 32 recites "... An optical communication system for managing alternate site switching, the optical communication system comprising a plurality of end-systems including a protected end-system, a primary end-system, and at least one backup end-system coupled over an optical communication network, ... wherein a failover tree is constructed to the at least one backup end-system prior to failure of the primary end-system and traffic is switched from the primary end-system to a backup end-system upon detecting a degradation or failure affecting the primary end-system...." Accordingly, for reasons similar to those put forth with regard to claims 1,18 and 30 claim 32 is also patentably distinct over the combination of Beardsley and Lamport, and it is requested that the rejection be withdrawn. Claim 33-47 serve to further limit claim 32 and are thus allowable with claim 32.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone the undersigned, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

__4/26/2006_____
Date

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